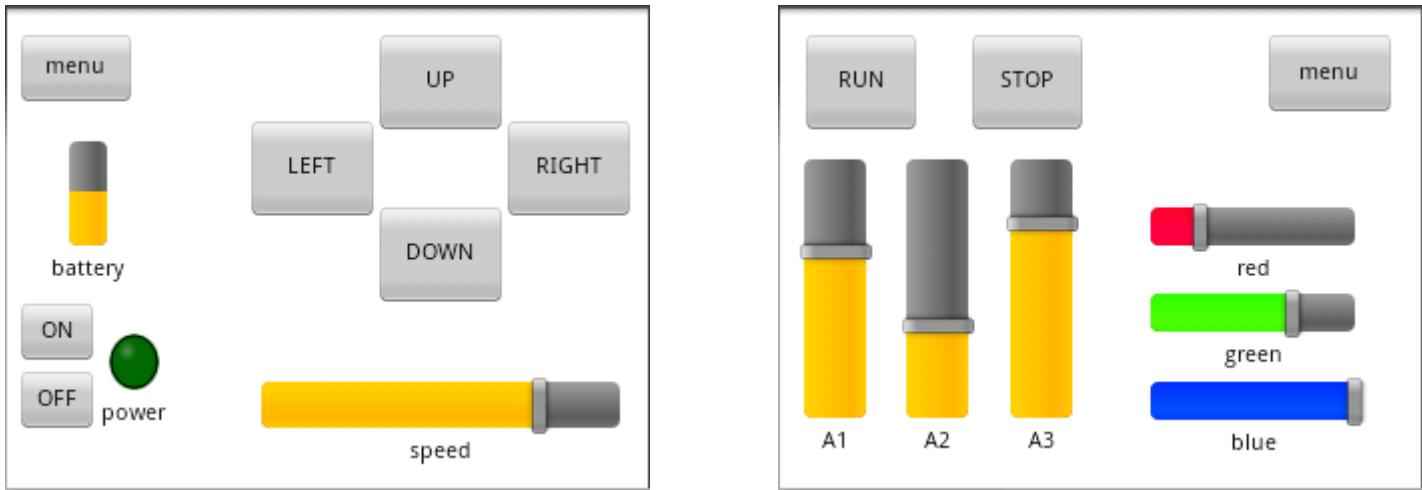


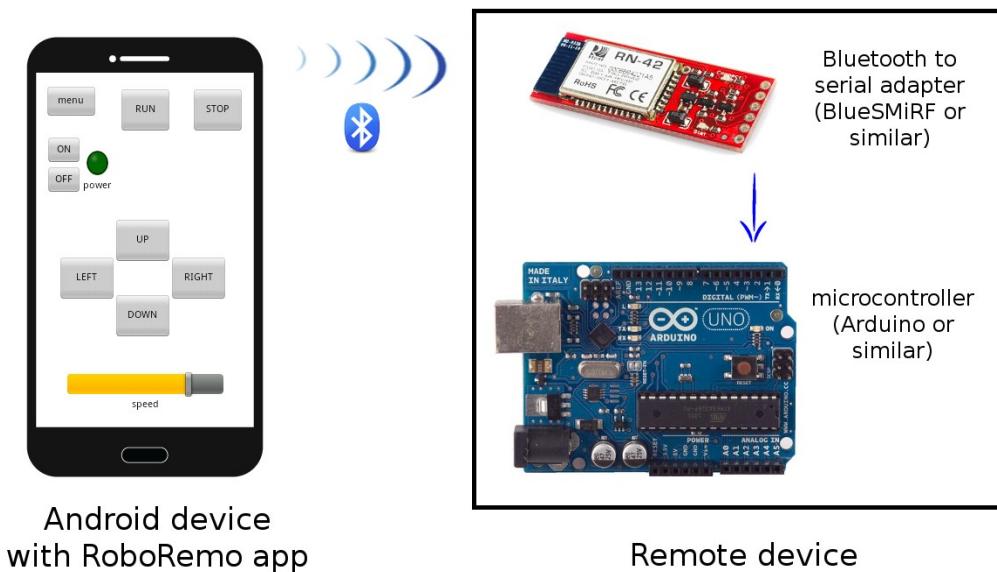
RoboRemo User Manual v1.6

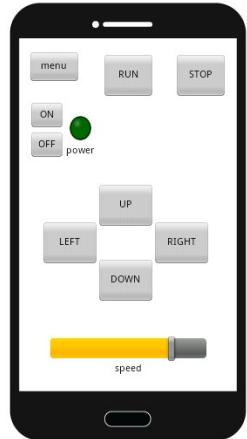


RoboRemo is a user **customizable** remote control application intended mainly for electronics **hobby projects**. RoboRemo can connect over **Bluetooth (RFCOMM)**, **Internet** or **WiFi (TCP)**.

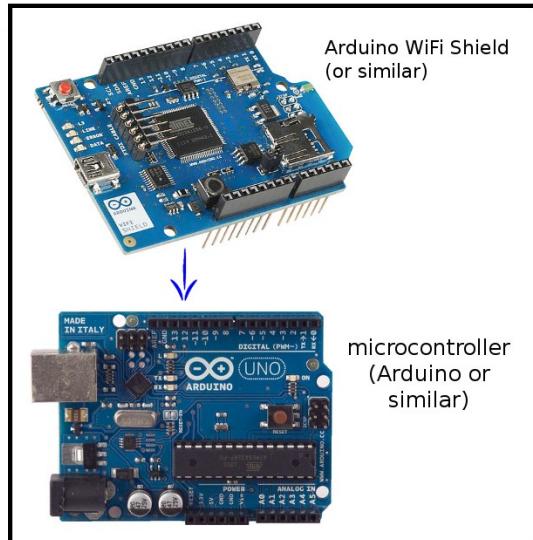
Disclaimer: Don't use RoboRemo for life support systems or any other situations where system failure may affect user or environmental safety. Please don't use RoboRemo in projects where high-level security is required.

To connect over **Bluetooth**, a remote device must contain a **Bluetooth to Serial adapter** like **BlueSMiRF**, **BTM-222**, **HC-05**, **HC-06**, etc. and a **microcontroller** programmed to interpret commands from RoboRemo. You can also find adapters for **Wifi** or **Ethernet**.

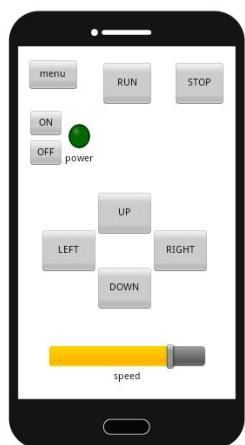




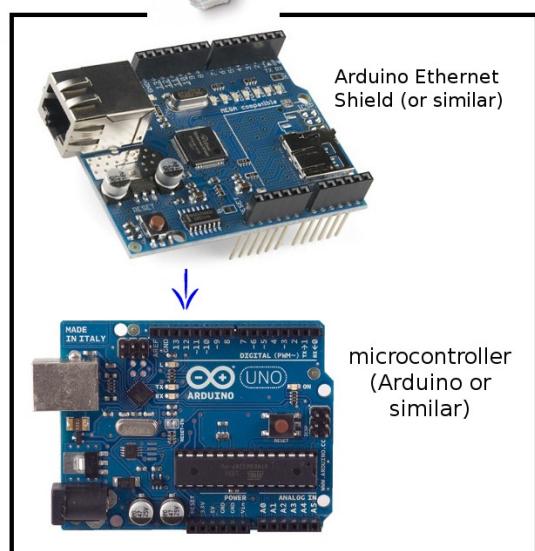
Android device
with RoboRemo app



Remote device



Android device
with RoboRemo app



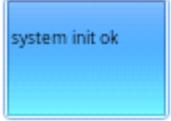
Remote device

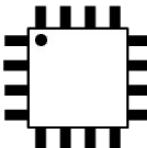
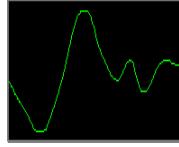
All the **commands** from RoboRemo are **text strings**, ending with **command ending** which is **LF character '\n'** (hex code 0x0A) by default, but **user can change it**. For example if you configure a button to send “abc” when pressed, it will send “abc\n” if command ending is '\n' or it will send “abcqwerty123” if command ending is “qwerty123”. The **command ending** is used by the microcontroller program **to know where each command ends**.

RoboRemo also can receive commands for updating some interface items (for example you can have a battery level indicator to monitor the battery level of the remote device). These **input commands also must end with command ending**.

It is **not** recommended to set command ending to **empty string**, because receiving commands from microcontroller to app will not work properly. (App “will think” that command ends after each received character). However the commands from app to microcontroller will be sent as expected (a button configured to send “abc” will send “abc”).

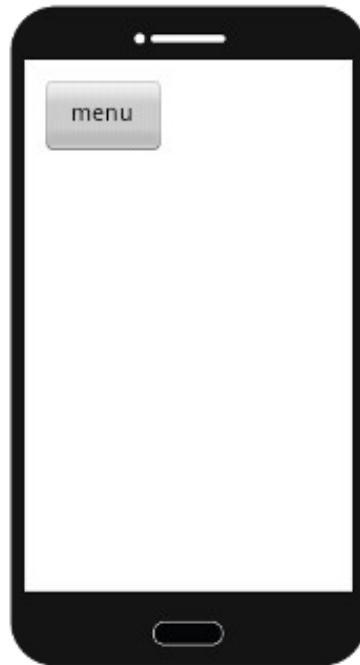
Available interface items:

item name	photo	description
button		Buttons can be used for sending commands to the remote device. A button can be configured to send one command when pressed and other command when released.
slider		Sliders can be used to vary remote device parameters, for example volume control, or motor speed or light intensity.
led		Leds can be used as indicators for remote device states.
level indicator		A level indicator item can be used to display data from remote sensors, for example temperature or battery level.
text log		A text log item is a log screen that can be used to display debug messages from the remote device.

accelerometer		The accelerometer can be used for sending periodically the acceleration measured by the phone's accelerometer. You can set the ids the 3 axes and the repeat (refresh) period.
text field	text	Text field item, to add some text to the interface. Note: if you want an item to be displayed on top of text field, copy the item, then remove it, then paste it.
plot		Plot item can be used to display some signals.

Building the interface

First when you open the RoboRemo app, it will look like this:



To edit the interface, click **menu** → **edit ui**.

Now in edit mode, **click on blank space** to add an item, then choose the item type.

Item will appear on screen. You can **move** it by dragging the **top left corner**, and **resize** by dragging the **bottom right corner**.

To edit item options, click on the desired item.

Button edit options:

option	description
copy	Copies the button so you can paste it when adding a new item.
remove	Removes the button.
set text	Sets the text that appears on button.
set press action	For remote action type (default): Sets the string to send to the remote device when you press the button. (RoboRemo will append the command ending to mark the end for each command). For local action type: Sets the local action to execute when you press the button.
set release action	For remote action type (default): Sets the string to send to the remote device when you release the button. (RoboRemo will append the command ending to mark the end for each command). For local action type: Sets the local action to execute when you release the button.
set repeat delay	Sets the button repeat delay in milliseconds. When you hold a button pressed, it will first repeat after this delay. Default is 0 (don't repeat)
set repeat period	Sets the button repeat period in milliseconds. When you hold a button pressed, it will first repeat after delay, then after period. Default is 0 (don't repeat)
set local / set remote	Changes button action type from remote to local, from local to remote. Default is remote.

Local actions:

action	description
“iface n” or “interface n”	select the nth interface. (n from 0 to 7)
“echo abc”	will simulate the receiving of “abc” command.
“disconnect”	disconnect from the remote device
“connect rfcomm 11:22:33:44:55:66 1” or “connect rfcomm 112233445566 1”	connect over Bluetooth RFCOMM to the remote device with address 11:22:33:44:55:66 and port 1.
“connect rfcomm e 112233445566 1”	Also use encryption.
“connect rfcomm 112233445566 d”	Connect using the default UUID
“connect rfcomm 112233445566 f”	Connect using the first UUID
“connect tcp 192.168.0.5:9876”	connect over tcp/ip to the remote device with ip 192.168.0.5 and port 9876.

Slider edit options:

option	description
copy	Copies the slider so you can paste it when adding a new item.
remove	Removes the slider.
set id	Sets the slider id string. For example if id is “s1” and you move the slider to the value 100 and command ending is “\n”, it will send “s1 100\n” (id followed by space followed by value followed by command ending).
set label	Sets the text string to appear under the slider. You can use the slider value inside the label. Examples for slider with value 100: label “speed = #*0.1” will show “speed = 10.0” label “x = #*-5+10 cm” will show “x = -490 cm”
set min	Sets the minimum value, default is 0.
set max	Sets the maximum value, default is 255.
send when moved / send when released	Sets the slider send mode, default mode is to send when released.
set color	Sets the slider color.
send space / don't send space	Select if you want the slider to send space character after id or not.
auto return /	Select if you want the slider to return to its center when released or not.

don't auto return	
set repeat period	Set the repeat period (in ms) for slider. 0 = don't repeat (default). When repeat enabled, the slider will also send its data periodically, in addition to normal operation.

Led edit options:

option	description
copy	Copies the led so you can paste it when adding a new item.
remove	Removes the led.
set id	Sets the led id string.
set on command	Sets the led on command, default is "1".
set off command	Sets the led off command, default is "0".
set label	Sets the text string to appear under the led
set color	Sets the led color.

Led examples:

Led id	led	ledA	ledB
Led on command	1	on	#>=10
Led off command	0	off	#<10
Interface command ending	\n	;	ok
To turn the led on, microcontroller must send	led 1\n	ledA on;	ledB 10ok or ledB 11ok etc.
To turn the led off, microcontroller must send	led 0\n	ledA off;	ledB 9ok or ledB 8ok etc.

Level indicator edit options:

option	description
copy	Copies the level indicator so you can paste it when adding a new item.
remove	Removes the level indicator.

set id	Sets the level indicator id string. For example if id is "batt" and command ending is "\n", you can set its level to 100 by sending "batt 100\n" from microcontroller.
set label	Sets the text string to appear under the level indicator. You can use the level indicator value inside the label. Examples for level indicator with value 100: label "temp. = #*0.5-10 °C" will show "temp. = 40.0 °C" label "batt. #*1%" will show "batt. 100%"
set min	Sets the minimum value, default is 0.
set max	Sets the maximum value, default is 255.
set color	Sets the level indicator color.

Text log edit options:

option	description
copy	Copies the text log so you can paste it when adding a new item.
remove	Removes the text log.
set id	Sets the text log id string. For example if id is "dbg" and command ending is "\n", you can append the message "qwerty" to the text log by sending "dbg qwerty\n" from microcontroller.
set label	Sets the text string to appear under the text log.

Accelerometer edit options

option	description
copy	Copies the item so you can paste it when adding a new item.
remove	Removes the item.
set x id	Sets the id for x axis. Accelerometer will periodically send the id followed by a space character (or not), followed by a floating point number representing the acceleration on that axis. You can disable an axis by setting the id to empty string.
set y id	Sets the id for y axis.
set z id	Sets the id for z axis.
set repeat period	Sets the repeat (refresh) period in ms for accelerometer. Default is 20.
send space / don't send space	Select if you want the accelerometer to send space character after ids or not.

Text field edit options:

option	description
copy	Copies the text field so you can paste it when adding a new item.

remove	Removes the text field.
set text	Sets the text to be displayed inside text field

Note: if you want an item to be displayed on top of text field, copy the item, then remove it, then paste it.

Plot edit options

option	description
copy	Copies item so you can paste it when adding a new item.
remove	Removes the item.
set id	Sets the plot id string. For example if id is "x" and command ending is "\n", you can add a new sample with value 100 to the plot by sending "x 100\n" from microcontroller.
set label	Sets the text string to appear under the plot.
set min	Sets the minimum value, default is 0.
set max	Sets the maximum value, default is 255.
set length	Sets the length (number of samples) to fit in one frame, default is 256. Maximum length is 10000.
set display mode	Sets the display mode for the plot. Scrolling (default) – plot scrolls from right to left, new data appears on the right. Oscilloscope – plot doesn't scroll. Data appears from left to right. When it reaches the end, it waits for trigger event, then starts again from the left.
set trigger	Sets the trigger threshold and edge (rising / falling / both / none). If none edge selected, then the trigger is off, so it will not wait for trigger event. For scrolling display mode there is no trigger (The trigger settings are ignored).

Menu options:

option	description
connect / disconnect	Connects to a remote device / disconnects from a remote device. To connect to a Bluetooth remote device, it has to be paired. To pair with a Bluetooth device, open Android settings → Bluetooth → search for devices. Pin code for Bluetooth to serial adapter is usually "1234" or "0000". Select port 1. To connect over internet or WiFi, data connection or WiFi has to be activated from Android settings. Then in RoboRemo app choose menu → connect → internet and select the ip and port.
edit ui / don't edit ui	Enters / exits the interface edit mode.
interface	Opens interface menu.

help	Shows help link.
about	Shows info about the app.
undo	Undo the last modification in the current interface.
enable / disable autoconnect	Enables / disables the auto connect option. If enabled, the app will try to connect to the last connected device at next app start, if the user did not select disconnect before closing app. (App disconnects automatically when closed).
lock / unlock autorotate	Locks / unlocks the screen autorotate function for the app.
set char delay	Slow microcontrollers need time to process each character received over serial port. You can set the char delay so that RoboRemo will wait after each character sent.
RFCOMM settings	Change RFCOMM settings. RFCOMM is the name for the Bluetooth Serial protocol. Default settings are: manual port selection, without encryption.

RFCOMM settings

port (channel) selection	manual = will ask each time fixed(1) = will use port 1 auto = will select automatically
UUID (for automatic)	Used only if port selection = auto. Ignored otherwise. default = use the well known UUID for Bluetooth to Serial modules, which is 00001101-0000-1000-8000-00805F9B34FB first = use first UUID of the remote device, from the local cache
encrypted	Use / don't use encryption.

Note: Some devices may fail to connect with certain settings. In this case it is recommended to try different settings.

Interface menu options

option	description
select	Select other interface. RoboRemo has 8 interfaces, numbered 0 to 7.
rename	Rename the current interface.
set connect action	Set a command string to be send to the remote devices after connecting.
set command ending	Change the command ending for the current interface. The default is "\n". Command ending can also be set to empty string, but it is not recommended.
import	Import an interface from file. Interfaces are stored in the roboremo folder on the SD card. The folder is created automatically at first app start.

export	Export the current interface to a file. Interfaces are stored in the roboremo folder on the SD card. The folder is created automatically at first app start.
clear	Clear the current interface.

New features and fixed bugs

App. version	New features	Fixed bugs
1.2	<ul style="list-style-type: none"> - accelerometer support - Internet / WiFi connectivity - option for sliders to return to center when released. 	N/A
1.3	<ul style="list-style-type: none"> - option to change command ending - string inputs from user are interpreted for escape characters ('\t', '\b', '\n', '\r', '\f'). For '\' character, enter '\\\'. 	<ul style="list-style-type: none"> - fixed interface import / export for interfaces with non-ASCII characters. - fixed text wrapping and auto scrolling when resizing text logs.
1.4	<ul style="list-style-type: none"> - local action "interface n" same as "iface n" where n is the interface number (0 to 7) - auto connect option - local actions for connecting and disconnecting by pressing buttons. - removed "exit" from menu (app can be closed by pressing back key). 	<ul style="list-style-type: none"> - fixed the bug with "\r\n" string in interfaces. - fixed a bug where app crashed if n was not an integer in "iface n" or "interface n" local action.
1.5	<ul style="list-style-type: none"> - option to use the slider or level indicator value inside their labels - made slider with "send when moved" send only when the value changes - option to change on and off commands for leds - removed the dialog showing error when sending a non-integer value to a level indicator - undo option in interface editor. 	<ul style="list-style-type: none"> - fixed a bug in processing received commands. Now if there are more items with same id, all of them will respond to it.
1.6	<ul style="list-style-type: none"> - added option to set repeat period for sliders - added text fields - added plots - improved touch processing algorithm so that it will send touch events only to interactive items (now you can have buttons / sliders hidden under leds, plots, etc) - added menu option to change RFCOMM settings 	<ul style="list-style-type: none"> - fixed a bug in sliders where slider with auto return enabled did not send data when it was the same value as before return.